

Class : 12Register
Number**FIRST REVISION EXAMINATION-JANUARY-2024**

Time Allowed : 3.00 Hours]

COMPUTER SCIENCE

[Max. Marks : 70

PART - I**Note : i) All the questions.****15X1 = 15****ii) Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.**

1. Which of the following is a distinct syntactic block?
(a) Subroutines (b) Function
(c) Definition (d) Modules
2. Which of the following Functions that built the abstract data type?
(a) Constructors (b) Destructors (c) Recursive (d) Nested
3. The process of building a variable name with an object is called
(a) Scope (b) Mapping (c) Late Binding (d) Early binding
4. Which of the following is used to describe the worst case of an Algorithm?
(a) Big A (b) Big S (c) Big W (d) Big O
5. Which of the following character is used to give comments in Python Program?
(a) # (b) & (c) @ (d) \$
6. Which of the following is known as Definite loop?
(a) do....while (b) while (c) for (d) if....elif
7. What will be the output of the following Python Code?
Str1 = "SCHOOL"
print (Str1 * 3)
(a) SCHOOL SCHOOL (b) SCHOOL SCHOOL SCHOOL
(c) SCHOOL (d) SCH SCH SCH
8. The Keys in Python, dictionary is specified by
(a) = (b) ; (c) + (d) :
9. Which of the following method is used as Destructor?
(a) - init - () (b) - dest - () (c) - rem - () (d) - del - ()
10. Who developed ER Model?
(a) Chen (b) EF Codd (c) Chend (d) Chand
11. Which of the following is string used to terminate lines produced by writer () method of CSV module?
(a) Lines Terminator (b) Entry Key (c) Form feed (d) Data Terminator
12. Which command lets to change the structure of Table?
(a) SELECT (b) ORDER BY (c) MODIFY (d) ALTER
13. Importing C++ program in a Python is called
(a) Wrapping (b) Downloading (c) Interconnecting (d) Parsing
14. Any changes made in the values of the record should be saved by the command
(a) save (b) save as (c) commit (d) oblige
15. ----- is a type of chart which display information as a series of data points connected by straight line segments.
(a) Line chart (b) Pie chart (c) Bar chart (d) All the above

PART - II**II. Note: Answer any six questions. Question number 24 is compulsory.****6x2=12**

16. What is a Pair? Give an example.
17. What are tokens in Python? List the types.
18. Write note on range () in loop.
19. How will you access the list elements in reverse order?
20. What is Class?
21. Write DML Commands.
22. What is the use of Modules?
23. What is Data Visualization?

KK / 12 / C.S / 1

24. What will be the output of the following Code?

```
Str1 = "Welcome to learn Python"
print (Str1 [ :- 2])
```

PART - III

Note: Answer any six questions. Question number 33 is compulsory.

6x3=18

25. What are the different ways to access the elements of List. Give example.

26. Why access Control is required?

27. Explain Ternary Operator with examples.

28. Write a program to display

```
A
A B
A B C
A B C D
A B C D E
```

29. What are the difference between List and Dictionary?

30. Write a SQL statement to modify the student table structure by adding a new field.

31. What is the difference between the Write mode and Append mode.

32. What are the Applications of Scripting Language?

33. Write a Python program to display the pattern

```
COMPUTER
COMPUTE
COMPUT
COMPU
COMP
COM
CO
C
```

PART - IV

IV. Note: Answer all questions.

5x5=25

34.(a) What are called Parameters and Write a note on

- i) Parameter without type
- ii) Parameter with type

(OR)

(b) Explain the Characteristics of an Algorithm.

35.(a) Explain Input () and Print () functions with examples.

(OR)

(b) Explain Recursive Function with an example.

36.(a) Explain about String Operators in Python with suitable examples.

(OR)

(b) Write a SQL statement to create a table for Employee having any five fields and create a table constraint for the employee table.

37.(a) Explain the different types of relationship Mapping.

(OR)

(b) Explain the purpose of the following Functions.

- a) plt. xlabel
- b) plt. ylabel.
- c) plt. title
- d) plt. legend ()
- e) plt. show ()

38.(a) What is the purpose of the SYS, OS getopt module in Python. Explain.

(OR)

(b) Explain the different Set Operations supported by Python with suitable example.

KK/12/C.S/2

**MOUNT CARMEL MISSION MATRIC HIGHER SECONDARY SCHOOL – KALLAKURICHI
FIRST REVISION EXAM – JANUARY – 2024 [ANSWER KEY]**

CLASS: XII

MARKS: 70

SUB: COMPUTER SCIENCE

TIME: 3 : 00 Hrs

PART – I**I. CHOOSE THE CORRECT ANSWER:****15 X 1 = 15**

- | | |
|--------------------------|-------------------------|
| 1. c) Definition | 11. a) Lines Terminator |
| 2. a) Constructors | 12. d) ALTER |
| 3. b) Mapping | 13. a) Wrapping |
| 4. d) Big O | 14. c) commit |
| 5. a) # | 15. a) Line chart |
| 6. c) for | |
| 7. b) SCHOOLSCHOOLSCHOOL | |
| 8. d) : | |
| 9. d) – del – () | |
| 10. a) Chen | |

PART – II**II. ANSWER ANY SIX QUESTIONS. Q.No: 24 IS COMPULSORY:****6 X 2 = 12****16. What is a pair? Give an example.**

Ans: To implement the concrete level of data abstraction python provides compound structure called Pair. Way of bundling two values together into one is considered as a pair. Lists are a common method to do so. Therefore List can be called as Pairs.

Example: lst[(0, 10), (1, 20)]

17. What are tokens in Python? List the types.

Ans: Python breaks each logical line into a sequence of elementary lexical components known as Tokens. The normal token types are

- 1) Keywords 2) Identifiers 3) Literals 4) Delimiters 5) Operators
(Pneumonic: KILDO)

18. Write note on range() in loop.

Ans: for loop uses the *range()* function in the sequence to specify the initial, final and increment values. *range()* generates a list of values starting from start till stop-1.

<p>Syntax: range (start, stop, [step]) where start → Initial value stop → Final value step → Increment value (optional)</p>	<p>Examples: range(1 , 15, 1) → 1, 2, 3, ... , 14.</p>
--	---

19. How will you access the list elements in reverse order?

Ans: A negative index can be used to access an element in reverse order

Example: Accessing elements in reverse order

Marks = [10, 23, 41, 75]

print(Marks[-1])

OUTPUT: 75

20. What is Class?

- Ans:** - Class is the main building block in Python
- Class is a template for the object
 - A Class can be defined anywhere in a Python program

21. Write DML Commands.

- Ans: - Expansion:** DML – Data Manipulation Language
- **Usage:** It is a query language use for adding(inserting), removing(deleting), modifying(updating) data in a database.
 - **Commands:** Insert, Update, Delete

22. What is the use of Modules?

- Ans:** - We use modules to break down large programs into manageable files.
- Modules provide reusability of code.
 - We can define most used functions in a module and import them.
 - Python has built in modules like os, sys and getopt, which we can import and access their functions.
 - We can define our frequently used functions in a module and import them.

23. What is Data Visualization?

Ans: Data Visualization is the graphical representation of information and data. The objective of Data Visualization is to communicate information visually to users. For this, data visualization uses statistical graphics. Numerical data may be encoded using dots, lines, or bars, to visually communicate a quantitative message.

24. What will be the output of the following Code?

```
str1 = "Welcome to learn Python"
print(str1[::-2])
```

Ans:

nhyre teoIW

PART – III

III. ANSWER ANY SIX QUESTIONS. Q.No: 33 IS COMPULSORY:

6 X 3 = 18

25. What are the different ways to access the elements of List. Give example.

Ans: The elements of a list can be accessed in two ways. The first way is multiple assignment, which unpacks a list into its elements and binds each element to a different name.

```
lst := [10, 20]
```

```
x, y := lst
```

In the above example x will become 10 and y will become 20.

A second method for accessing the elements in a list is by the element selection operator, also expressed using square brackets. Unlike a list literal, a square brackets expression directly following another expression does not evaluate to a list value, but instead selects an element from the value of the preceding expression.

```
lst[0]
```

```
10
```

```
lst[1]
```

```
20
```

26. Why access control is required?

Ans: Access control is a security technique that regulates who or what can view or use resources in a computing environment. It is a fundamental concept in security that minimizes risk to the object. In other words access control is a selective restriction of access to data.

27. Explain Ternary Operator with examples.

Ans: - Ternary operator is also known as conditional operator.
 - It evaluates something based on a condition being true or false.
 - It replaces the multiline if-else making the code compact.

Syntax:

Variable name=[on_true] if [Test expression] else [on_false]

Example:

min = 50 if 49<50 else 70 # min = 50

min = 50 if 49>50 else 70 # min = 70

28. Write a program to display

A

A B

A B C

A B C D

A B C D E

Ans:

```
for i in range(1,6,1):
```

```
    for j in range(65, 65+i,1):
```

```
        alpha = chr(j)
```

```
        print(alpha,end= ' ')
```

```
    print('\n')
```

```
s="A B C D E"
```

```
for i in range(1,len(s) + 1, 2):
```

```
(OR) print(s[0:i])
```

29. What are the difference between List and Dictionary?

Ans:

LIST	DICTIONARY
List is an ordered set of elements.	Dictionary is a data structure used for matching one element(Key) with another (Value).
Index values can be used to access a particular element.	Key represents index, Key may be a number or a string.
Lists are used to look up a value.	Dictionary is used to take one value and look up another value.

30. Write a SQL statement to modify the student table structure table structure by adding a new field.

Ans:

Table name : student

New field to be added : area

Command used to add : ALTER

SQL statement : **ALTER TABLE Student ADD area char(20);**

31. What is the difference between the Write mode and Append mode.

Ans:

Write mode	Append mode
'w' write mode overwrites if the file already exists.	'a' append mode adds the data at the end of the file if the file already exists.
Always writes the data from the beginning of the new file.	Keeps the record pointer at the end of the file if file already exists.

32. What are the Applications of Scripting Language?

Ans: Applications of Scripting Languages:

1. To automate certain tasks in a program
2. Extracting information from a data set
3. Less code intensive as compared to traditional programming language
4. Can bring new functions to applications and glue complex systems together

33. Write a Python program to display the pattern

```

COMPUTER
COMPUTE
COMPUT
COMPU
COMP
COM
CO
C

```

Ans:

```

str1 = "COMPUTER"
index = len(str1)
for i in str1:
    print(str1[:index])
    index-=1

```

PART – IV

IV. ANSWER ALL THE QUESTIONS:

5 X 5 = 25

34. a) What are called Parameters and Write a note on

i) Parameter without type

ii) Parameter with type

Ans: Parameters are the variables in a function definition.

i. Parameter without type: Data types are not mentioned in this type. Some language compilers solve this type of inference problem algorithmically, but some require the type to be mentioned.

For example:

```

(requires: b>=0)
(returns: a to the power of b)
let rec pow a b:=
    if b = 0 then 1
    else a * pow a(b - 1)

```

In the above example

- Data type for a and b is not mentioned.
- Some compilers solve parameter without type algorithmically.

- b is compared to zero(int), so b is int.
- a is multiplied with int expression, so a is also int.

ii. Parameter with Type:

- Data types are explicitly annotated.
- Explicit annotating the data type can help with debugging.

For example:

```
(requires: b > 0)
(returns: a to the power of b)
let rec pow (a: int) (b: int) : int :=
  if b = 0 then 1
  else a * pow a(b - 1)
```

When we write the type annotations for 'a' and 'b' the parentheses are mandatory.

[OR]

b) Explain the characteristics of an Algorithm.

Ans: - An algorithm is a finite set of instructions to accomplish a particular task.

- Algorithms must have input, output and should satisfy the following characteristics such as definiteness, correctness and effectiveness.

Characteristics of an Algorithm:

- An algorithm should have the following characteristics:

Input	Zero or more quantities to be supplied.
Output	At least one quantity is produced.
Finiteness	Algorithms must terminate after finite number of steps.
Definiteness	All operations should be well defined. For example operations involving division by zero or taking square root for negative number are unacceptable
Effectiveness	Every instruction must be carried out effectively
Correctness	The algorithms should be error free
Simplicity	Easy to implement
Unambiguous	Algorithm should be clear and unambiguous. Each of its steps and their inputs/outputs should be clear and must lead to only one meaning.
Feasibility	Should be feasible with the available resources
Portable	An algorithm should be generic, independent of any programming language or an operating system able to handle all range of inputs.
Independent	An algorithm should have step-by-step directions, which should be independent of any programming code.

35. a) Explain input() and print() functions with example.

Ans: A program needs to interact with the user which shall be achieved using **Input-Output functions.**

input() function

In Python, **input()** function is used to accept data as input at run time.

The **input()** accepts all data as string or characters but not as numbers.

The input values should be explicitly converted into numeric data type using **int()** function.

Syntax:

```
variable = input ("prompt string") # prompt string in the syntax is a statement or message to the user
```

```
variable = input () # takes whatever is typed from the keyboard
```

Example:

```
city = input ("Enter Your City:")
city = input()
```

OUTPUT:

```
Enter Your City: CHENNAI
CHENNAI
```

print() function

The **print()** function is used to display result on the screen

Syntax:

```
print("string to be displayed as output")
print(variable)
print("string to be displayed as output", variable)
```

Example:

```
print("Welcome to Python Programming")
print(z)
print("The sum =",z)
```

[OR]

b) Explain Recursive Function with an example.

Ans: Recursive functions:

- When a function calls itself is known as recursion.
- Recursion works like loop but sometimes it makes more sense than loop.
- It is possible to convert any loop to recursion.
- A base condition is must in every recursive function.

Working:

Recursion works like loop but sometimes it makes more sense to use recursion than loop.

- Recursive function is called by some external code.
- If the base condition is met then the program gives meaningful output and exits.
- Otherwise, function does some required processing and then calls itself to continue recursion.

Base Condition:

- The condition that is applied in any recursive function to stop recursion is known as base condition.
- A base condition is must in every recursive function otherwise it will continue to execute like an infinite loop.

Changing the limit for recursion:

To change the limit it provides a function `sys.setrecursionlimit()` which can be used by importing `sys`.

Syntax: `sys.setrecursionlimit(limit_value)`

Example: `sys.setrecursionlimit(3000)`

Recursion Syntax:

```
def <functionname(parameter1, parameter2....)>:
    <Block of statements with Base case and Recursive case>
    return <expression/None>
```

Example:

```
def fact(n):
    if n == 0:
        return 1
    else:
        return n * fact (n-1)
print (fact (5))
```

OUTPUT:

120

36. a) Explain about string operators in python with suitable example.

Ans:

Operation	Operator	Description	Example
Concatenation	(+)	- Joining of two or more strings is called as Concatenation. - The plus (+) operator is used to concatenate strings in python.	>>> "welcome" + "Python" welcomePython
Append	(+=)	- Adding more strings at the end of an existing string is known as append. - The operator += is used to append a new string with an existing string.	>>> str1= "Welcome to" >>> str1+="Learn Python" >>>print(str1) Welcome to Learn Python
Repeating	(*)	- The multiplication operator (*) is used to display a string in multiple number of times.	>>> str1="Welcome" >>>print (str1*2) WelcomeWelcome
String Slicing str[start:end] start – beginning index end – last index value	[:]	- Slice is a substring of a main string. - A substring can be taken from the original string by using [] operator and index or subscript values. - [] is also known as slicing operator which is used to slice one or more substrings from a main string.	>>> str1="THIRUKKURAL" >>>print (str1[:5]) THIRU >>>print(str1[6:]) KURAL >>>print(str1[3:7]) RUKK
Stride when slicing	[::]	- It is the slicing operation with a third argument as stride. - It refers to the number of characters to move forward after the first character is retrieved from the string. - The default value of stride is 1.	>>>str1="Welcome to Python" >>>print (str1[11:15:3]) Ph >>>print(str1[::2]) Wloet uhn >>> print(str1[:::-1]) nohtyP ot emocleW

[OR]

b) Write a SQL statement to create a table for employee having any five fields and create a table constraints for the employee table.

Ans:

Table name : employee
No. of fields : 5 (Empno, Empname, Age, Desig, Salary)
CREATE TABLE Student
(
Empno integer,
Empname char(20) NOT NULL,
Age integer(CHECK>20),
Desig char(20) NOT NULL,
Salary integer (CHECK>10000), PRIMARY KEY (Empno)
);

Result: The above command creates a table

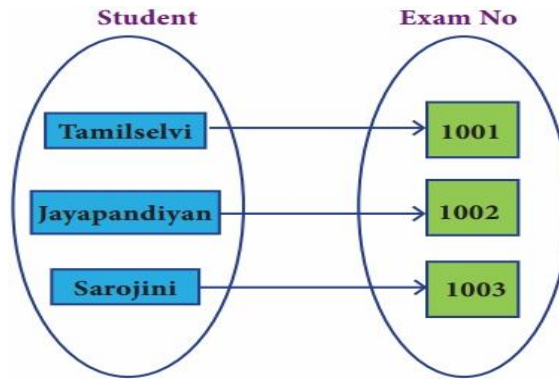
Empno	Empname	Age	Desig	Salary
.
.

37. a) Explain the different types of relationship mapping.

- Ans: i. one-to-one relationship
 ii. one-to-many relationship
 iii. many-to-one relationship
 iv. many-to-many relationship

i. one-to-one relationship: In one-to-one relationship, one entity is related with only one other entity. one row in a table is linked with only one row in another table and vice versa.

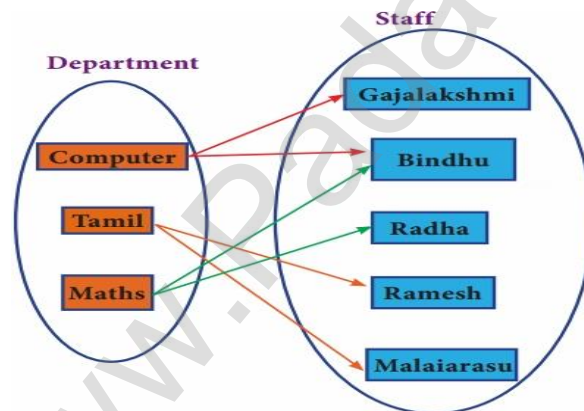
For example: A student can have only one exam number



One to one Relationships

ii. one-to-many relationship: In one-to-many relationship, one entity is related with many other entities. one row in a table A is linked to many rows in a table B, but one row in a table B is linked to only one row in table A.

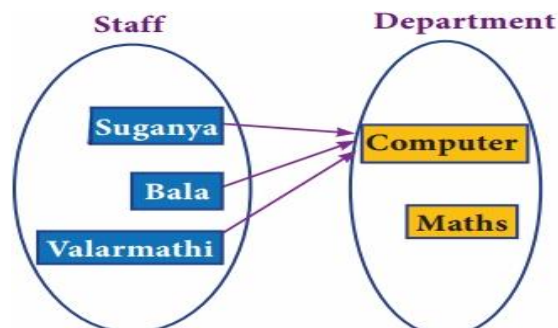
For example: One Department has many staff members.



One to Many Mapping

iii. Many-to-One relationship: In Many-to-One relationship, many entities can be related with only one in the other entity.

For example: A number of staff members working in one Department. Multiple rows in staff members table is related with only one row in Department table.

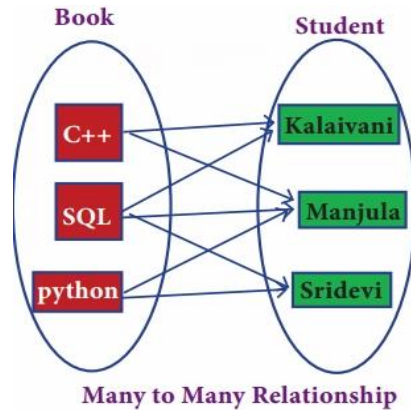


Many to one Relationship

iv. Many-to-Many relationship: A many-to-many relationship occurs when multiple records in a table are associated with multiple records in another table.

Example: Books and Student

Many Books in a Library are issued to many students.



[OR]

b) Explain the purpose of the following Functions.

- a) `plt. xlabel`
- b) `plt. ylabel`
- c) `plt. title`
- d) `plt. legend()`
- e) `plt. show()`

Ans:

- a) `plt. xlabel`
`plt. xlabel()` —→ specifies label for X-axis.
- b) `plt. ylabel`
`plt. ylabel()` —→ specifies label for Y-axis.
- c) `plt. title`
`plt. title()` —→ specifies title to the graph.
- d) `plt. legend()`
`plt. legend()` —→ displays legend on the graph.
- e) `plt. show()`
`plt. show()` —→ method displays the plot.

38. a) What is the purpose of the SYS, OS, getopt module in Python. Explain.

Ans: i. sys module:

Purpose: sys module provides access to some variables used by the interpreter and to functions that interact strongly with the interpreter.

`sys.argv` is the list of command-line arguments passed to the Python program. `argv` contains all the items that come along via the command-line input, it's basically an array holding the command-line arguments of the program.

To use `sys.argv`, you will first have to import `sys`.

For example:

```
Command: python hybrid.py -i cppprg
print(sys.argv[0]) —→ hybrid.py
print(sys.argv[1]) —→ -i
print(sys.argv[2]) —→ cppprg
```

ii. os module:

Purpose: The OS module in Python provides a way of using operating system dependent functionality.

os.system(): Allows to interface with the Windows operating system where Python is running on.

Example: os.system('g++' + cpp_file)

iii. getopt module: The getopt module of Python helps to parse (split) command-line options and arguments. This module provides two functions to enable command-line argument parsing.

getopt.getopt method: This method parses command-line options and parameter list.

Syntax: <opts>, <args>=getopt.getopt(argv, options, [long_options])

Where

opts → Contains list of splitted strings like mode, path.

args → Contains any string if at all not splitted because of wrong path or mode.

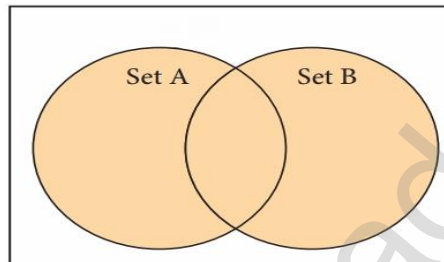
[OR]

b) Explain the different set operations supported by Python with suitable example.

Ans: - Python supports the set operations such as Union, Intersection, Difference and Symmetric difference.

i. UNION: It includes all elements from two or more sets

The operator | is used to union of two sets. The function union() is also used to join two sets in python.



Example: Program to Join (Union) two sets using union operator

```
Set_A = {2,4,6,8}
```

```
Set_B = { 'A', 'B', 'C', 'D' }
```

```
U_set = set_A | set_B
```

```
print(U_set)
```

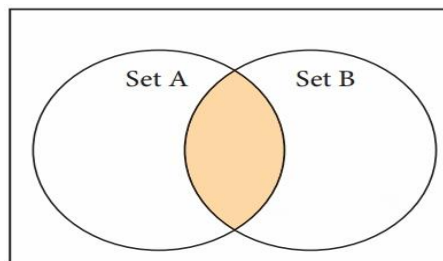
OUTPUT:

```
{ 2, 4, 6, 8, 'A', 'D', 'C', 'B' }
```

ii. INTERSECTION: It includes the common elements in two sets.

The operator & is used to intersect two sets in python.

The function intersection() is also used to intersect two sets in python.



Example: Program to intersect two sets using intersection operator

```
Set_A = {'A', 2, 4, 'D'}
Set_B = {'A', 'B', 'C', 'D'}
print(set_A & set_B)
```

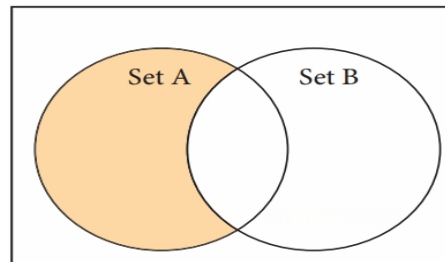
OUTPUT:

```
{'A', 'D'}
```

iii. DIFFERENCE: It includes all elements that are in first set (say set A) but not in the second set (say set B)

The minus (-) operator is used to difference set operation in python.

The function difference() is also used to difference operation.



Example: Program to difference of two sets using minus operator

```
Set_A = {'A', 2, 4, 'D'}
Set_B = {'A', 'B', 'C', 'D'}
print(set_A - set_B)
```

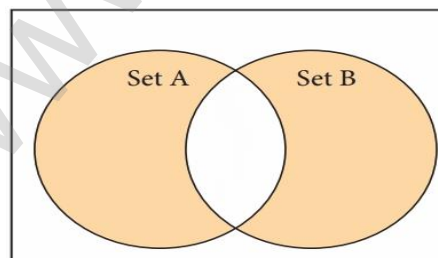
OUTPUT:

```
{2, 4}
```

iv. SYMMETRIC DIFFERENCE: It includes all the elements that are in two sets (say sets A and B) but not the one that are common to two sets.

The caret (^) operator is used to symmetric difference set operation in python.

The function symmetric_difference() is also used to do the same operation.



Example: Program to symmetric difference of two sets using caret operator

```
Set_A = {'A', 2, 4, 'D'}
Set_B = {'A', 'B', 'C', 'D'}
print(set_A ^ set_B)
```

OUTPUT:

```
{2, 4, 'B', 'C'}
```

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